

Superconducting Current Leads for Cryogenic Systems, Phase I

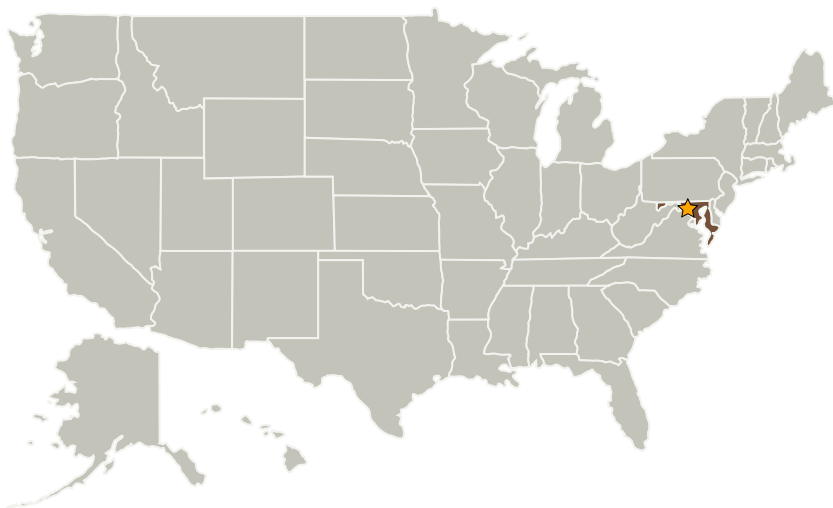
Completed Technology Project (2008 - 2008)



Project Introduction

Space flight cryocoolers will be able to handle limited heat loads at their expected operating temperatures and the current leads may be the dominant contributor to the heat load. In the present SBIR, we propose an innovative approach that could significantly reduce heat loads introduced by current carrying leads in a variety of space flight cryocoolers. Our approach uses high-temperature superconducting (HTS) current leads with zero dissipation for DC currents, developed on flexible low-thermal conductivity substrates (ceramic yttria stabilized zirconia). The unique film/substrate combination when implemented for developing low-thermal budget DC current leads is expected to allow thermal loads less than 1 mW when operated between 80K and 10K. Successful accomplishment of program objectives will lead to a unique, low thermal load, superconducting current lead platform, significantly enhancing the over all performance of the cryogenic subsystems.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Neocera, LLC	Supporting Organization	Industry	Beltsville, Maryland



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Solomon Kolagani

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.1 Cryogenic Systems
 - └ TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors